DETAILS OF WEATHER OF THE MONTH IN THE UNITED STATES.

CYCLONES AND ANTICYCLONES.

By A. J. HENRY.

Rather more than the usual number of cyclones (15) appeared on the daily weather charts of September. While the predominating movement was eastward from the Canadian Northwest, there was a small number of secondary developments over the Plateau and Rocky Mountain regions and also over the middle portion of the North Atlantic, so that as a whole the movement was somewhat diversified. A single destructive tropical cyclone (Track No. IV, Chart III) moved into the field of observations. (See pp. 664–673, this REVIEW.) The second disturbance (see Track No. XVII) of apparent tropical origin at no time, so far as known, possessed the characteristics of a tropical cyclone. The feature of outstanding interest in connection with the movement of the severe tropical cyclone of the 6th–15th was the fact that it did not recurve to the northwest over the Gulf of Mexico. Evidently it skirted the southern border of the area of high pressure that encircles the globe in the vicinity of north latitude 30°, and was dissipated over northern Mexico.

Anticyclones.—Eight anticyclones have been plotted on Chart II, the majority of which first appeared over the Canadian Northwest or the Pacific off the California and Oregon coasts. The movement was eastward with a considerable southerly component in all cases.

THE WEATHER ELEMENTS.

By P. C. DAY, Climatologist and Chief of Division.

[Dated: Weather Bureau, Washington, Nov. 1, 1919.]

PRESSURE.

During the greater part of the first decade, pressure was moderately high over most eastern districts, and comparatively low from the Rocky Mountains to the Pacific. Normal pressures followed, except over the Gulf of Mexico, where the large and severe West Indian hurricane was. The remains of this storm moved into New Mexico September 14–17.

During the latter part of the second decade a low pressure area developed in the central Plains region and moved thence to the Great Lakes. This was followed by another early in the last decade. At the same time a wide area of high barometric pressure moved into the far Northwest and gradually overspread the central and eastern districts, reaching the Atlantic coast by the end of the decade. At the end of the month there were indications of a storm of some intensity off the south Atlantic coast.

The average pressure for the month (Chart VII, Tables I and III) was everywhere near the normal, but mostly below. Over most of the area east of the Mississippi and south of the Ohio Rivers the pressure was slightly higher than normal, save along the immediate Gulf Coast where the low pressure attending the tropical storm materially affected the average. From the Missouri Valley northward into Canada there was likewise an area with average pressure above the normal.

The prevailing winds (Chart VII, Tables I and III) were mostly from the south over the plains area from Texas to near the northern boundary, and in portions of the Mississippi valley and the Great Lake region. They were mostly from the northeast over the South Atlantic and east Gulf States, and from the northwest along the Pacific coast.

TEMPERATURE.

At the beginning of the month cool weather for the period of the year prevailed over the eastern portions of the country and in the far West, but in the Rocky Mountain region temperatures were much higher than normal. By the 3d, temperatures in the far Southwest had risen to considerably above normal, the maximum day temperatures at numerous points in Arizona and New Mexico ranging from 100° to 112° F. From the 5th to the 10th the highest readings of the month were recorded in all districts east of the Rocky Mountains, save over the Southeastern States where the highest temperatures occurred at the beginning of the second decade. In portions of the Lake region maximum temperatures about the 8th were the highest ever recorded in September. During this period temperatures remained moderately low in the far West, particularly in the central valleys of California where serious concern was felt over the slow ripening and drying of fruit.

The second decade opened with a general fall in temperature over the Missouri Valley, which gradually extended eastward, with the greatest changes over the more northern districts. By the middle of the decade temperatures in nearly all portions of the country had returned to near the normal for the season and remained so, with minor exception, throughout the remainder of the decade, save about the 18th, when sharp falls were observed in the northeastern districts and light to heavy frosts occurred at exposed points in New York and New England.

At the beginning of the third decade a strong high-pressure area was advancing into the North Pacific States and by the morning of the 22d had overspread the northern Rocky Mountain and adjacent districts, accompanied by the coldest weather of the month. Freezing temperatures prevailed over considerable areas, and the first severe frosts of the season were reported at exposed points from Montana and Wyoming to the eastern portions of Oregon and Washington. At the same time, summer temperatures were prevailing east of the Mississippi and much warmer weather had set in over the interior portions of California. With the eastward movement of the cold area the lowest temperatures of the month were very generally observed. Frosts or freezing temperatures were confined to limited areas over the more northern districts. Much needed warmth continued during the greater part of the decade in the large fruit districts of California. The maximum temperatures were frequently near 100° and the drying of prunes and raisins progressed under the most favorable conditions.

At the close of the month there had been a considerable drop in temperature over portions of the Great Lakes and in the far West, but elsewhere temperatures were near the seasonal normal.

Maximum temperatures for the month as high as 112° were reported from points in California and Arizona, and they ranged from 100° to 109° locally in practically all States from the Appalachian Mountains west to the Pacific. In the Lake region and generally over the northeastern States the maxima were slightly below 100° F.

Minimum temperatures were below freezing toward the end of the month over the more northern States, and in portions of the western mountains they were below 20° F., notably 9° and 3° F. in Wyoming and Montana, respectively.

For the month as a whole the average temperature was above normal practically throughout the country, and, while the departures from the normal were not generally large (see Chart IV), some sections had the warmest September in many years, notably 30 years in central Wyoming. In portions of the middle Plateau region September was the sixth consecutive month with mean temperature above the normal. In northern Michigan, however, it was the first month this year with a mean temperature below normal.

PRECIPITATION.

The month opened with showery weather along the Atlantic seaboard, and with local rains in the central Rocky Mountain and Plateau areas. During the following few days showers occurred in the extreme northeast and southeast sections, and also in the central Rocky Mountains and portions of the Missouri and upper Mississippi Valleys. However, the greater part of the first decade of the month was dry, except along the North Pacific coast, the extreme northern border and over the Florida Peninsula and locally along the Gulf coast.

The West Indian hurricane caused rain all along the immediate Gulf coast, then about the middle of the month it passed inland near the mouth of the Rio Grande. Figure 1, page 640, shows the rainfall of this storm in Texas and New Mexico, locally exceeding 9 inches. At the same time, showers were fairly general over the Great Lakes and the North Atlantic States.

During the latter part of the decade showers occurred in the Southwest and about the 18th a storm of considerable intensity moved from Kansas to the Great Lakes, accompanied by more or less general, and in some districts, heavy rains. A second rain area covered most of the country east of the Great Plains during the early part of the last decade, bringing heavy and well distributed precipitation to many sections where drought conditions had prevented preparation of the soil for fall seeding. The last few days of the month there was more or less precipitation in the West, and eastward to the Great Lakes. In parts of southern California the rains were remarkably heavy for the time of year; and effectually checked the forest fires, locally serious.

The precipitation for the month is shown on Chart V. In portions of the east Gulf States, where rain is usually abundant in September, the totals were mostly small and over large areas no appreciable precipitation occurred during the entire month. In portions of Virginia, the Carolinas, and Alabama it was the driest September in nearly 50 years; on the other hand in portions of Arizona and the Southwest the month was the wettest of record, and in Texas it was the fifth consecutive month with precipitation above the normal. Generally speaking, the precipitation was far below normal over all the Gulf States east of the Mississippi River and along the Atlantic coast from Virginia southward. There was generally a large excess from Texas to southern California, as well as from southern Nebraska to Lake Michigan, and over small areas in New England.

SNOWFALL.

Some snow was reported in the Rocky Mountain region as early as the 21st and considerable amounts fell in the higher elevations, particularly in the more northern districts during the last few days of the month. In Montana depths of 5 to 10 inches were reported from numerous points and falls of 2 feet or more were reported locally. In the high Sierra of California as much as 10 inches fell in a few localities.

RELATIVE HUMIDITY.

In New England and generally west of the Mississippi Valley, except in the far Northwest, the relative humidity was above normal, with unusually large departures from Texas westward and over portions of the middle Rocky Mountain and Plateau districts. From the middle Mississippi Valley eastward to near the Atlantic coast the atmosphere was relatively far drier than normal, a condition naturally resulting from the generally high temperatures and the absence of any considerable rainfall.

SEVERE STORMS.

The West Indian hurricane and two associated tornadoes are described on pages 639,640, and 664–673.

Average accumulated departures for September, 1919.

Districts.	Temperature.			Precipitation.			Cloudiness.		Relative humidity.	
	General mean for the current month.	Departure for the current month.	Accumulated departure since Jan. 1.	General mean for the current month.	Departure for the current month.	Accumulated departure since Jan. 1.	General mean for the current month.	Departure from the normal.	General mean for the current month.	Departure from the normal.
	°F.	°F.	°F.	In.	In.	In.	0–10		P. ct.	
New England	60.6	−0.1	+14.3	4.42	+1.20	+2.21	6.2	+1.0	82	+1
Middle Atlantic	67.5	+1.6	+19.4	1.85	−1.50	−2.10	4.6	−0.1	75	+3
South Atlantic	73.7	+0.8	+ 9.0	1.59	−3.00	−4.30	3.5	−1.1	74	−7
Florida Peninsula	81.2	0.0	− 2.9	8.26	+0.30	+6.40	5.7	+0.2	78	−3
East Gulf	76.5	+1.7	+ 1.3	0.88	−3.00	+1.96	4.1	−0.4	72	−6
West Gulf	76.7	+1.0	− 7.5	4.01	+0.60	+3.10	4.9	+0.8	77	+3
Ohio Valley and Tennessee	70.5	+2.7	+12.1	1.70	−1.10	−2.20	4.1	−0.3	68	−6
Lower Lakes	64.7	+1.6	+18.7	2.23	−0.60	−0.90	5.4	+0.5	70	−4
Upper Lakes	61.6	+2.7	+29.7	3.06	−0.20	−3.20	5.9	+0.7	75	−3
North Dakota	59.1	+2.0	+29.2	0.90	−0.50	−2.35	5.1	+0.7	67	−2
Upper Mississippi Valley	68.4	+3.5	+21.4	4.16	+0.80	0.00	4.6	+0.2	71	−4
Missouri Valley	69.1	+4.2	+23.1	2.68	−0.10	−3.10	4.3	+0.1	67	−1
Northern slope	59.2	+1.8	+25.9	1.37	+0.30	−3.50	4.4	+0.3	62	+3
Middle slope	70.8	+3.3	+11.0	1.40	−0.60	−4.50	4.4	+1.0	64	+3
Southern slope	73.4	+0.6	−10.9	5.59	+3.00	+0.40	5.0	+1.4	70	+5
Southern Plateau	71.0	+0.5	+ 5.6	1.56	+0.60	+1.19	2.9	+0.4	51	+9
Middle Plateau	63.1	+0.7	+12.0	1.24	+0.60	−2.30	3.0	0.0	44	+2
Northern Plateau	60.8	−0.3	+14.7	0.94	+0.20	−2.70	3.5	+0.2	51	+1
North Pacific	59.0	+1.4	+10.2	2.34	−0.10	−4.80	4.6	−0.8	76	−3
Middle Pacific	63.4	− .1	− 5.4	0.77	+0.20	−1.80	3.5	+0.3	64	+1
South Pacific	68.1	0.0	+ 5.1	0.56	+0.40	−3.40	2.8	+0.1	69	+3

Winds of 50 mi/hr. (22.4 m./sec.), or over, during September, 1919.

Station.	Date.	Velocity.	Direction.	Station.	Date.	Velocity.	Direction.
Buffalo, N. Y.	19	74	sw.	Modena, Utah	6	56	sw.
Do	20	62	sw.	Mt. Tamalpais, Calif	3	66	nw.
Do	24	56	sw.	Do	4	68	nw.
Do	25	56	sw.	Do	5	62	nw.
Corpus Christi, Tex.	14	72	ne.	Do	6	70	nw.
Do	15	70	se.	Do	27	54	sw.
Del Rio, Tex.	15	58	e.	North Head, Wash.	30	72	s.
Galveston, Tex.	14	53	e.	San Antonio, Tex.	15	52	se.
Houghton, Mich.	20	63	nw.	St. Paul, Minn.	26	51	s.
Key West, Fla.	9	100	e.	Toledo, Ohio.	19	64	s.
Do	10	110	e.				